

Application Number

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M844	08-19-2004	9	<input checked="" type="checkbox"/>	08-11-2005 00:31:54 IDS CONV

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L7: Entry 1 of 16

File: USPT

Aug 30, 2005

US-PAT-NO: 6937968

DOCUMENT-IDENTIFIER: US 6937968 B1

TITLE: Method and apparatus for sequentially profiling and solving problems in space mission analysis

DATE-ISSUED: August 30, 2005

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Carrico; John P.	Laurel	MD		
Stoner; Frank T.	Collegeville	PA		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Analytical Graphics, Inc.	Exton	PA			02

APPL-NO: 09/490173 [\[PALM\]](#)

DATE FILED: January 22, 2000

## PARENT-CASE:

RELATED APPLICATIONS This application claims priority from U.S. provisional patent application No. 60/116,546, filed Jan. 21, 1999.

INT-CL: [07] [G06 G 7/48](#)

US-CL-ISSUED: 703/8; 703/2, 703/6, 701/13, 701/23, 701/210

US-CL-CURRENT: [703/8](#); [701/13](#), [701/210](#), [701/23](#), [703/2](#), [703/6](#)

FIELD-OF-SEARCH: 703/8, 703/6, 703/2, 701/13

## PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

[Search Selected](#)[Search ALL](#)[Clear](#)

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<a href="#">5550742</a>	August 1996	Furuya et al.	244/161
<input type="checkbox"/>	<a href="#">6048366</a>	April 2000	Ellis et al.	703/8
<input type="checkbox"/>	<a href="#">6122572</a>	September 2000	Yavnai	701/23
<input type="checkbox"/>	<a href="#">6130705</a>	October 2000	Lareau et al.	348/144

<input type="checkbox"/>	<u>6442482</u>	August 2002	Belbruno	701/13
<input type="checkbox"/>	<u>6505119</u>	January 2003	Schwaerzler	701/210
<input type="checkbox"/>	<u>6735557</u>	May 2004	Castellar et al.	703/5
<input type="checkbox"/>	<u>6789054</u>	September 2004	Makhlouf	703/6
<input type="checkbox"/>	<u>6859769</u>	February 2005	Tanygin	703/8

## OTHER PUBLICATIONS

Carrico, J., et al., "Rapid Design of Gravity Assist Trajectories," Proceedings of the ESA Symposium on Spacecraft Flight Dynamics, ESA SP-326, Dec. 1991.

Carrico, J. et al., "An Interactive Tool Design and Support of Lunar, Gravity Assist . . . ," AIAA/AHS/ASEE Aerospace Design Conference, Feb. 1993, AIAA, Washington DC.

Carrico, J., et al., "Operational Use of Swingby . . . ," AAS/AIAA Astrodynamics Specialist Conference, Aug. 14-17, 1994, AAS Publications, San Diego, CA.

NASA Goodard Flight Center, "Mission Analysis and Design Tool (Swingby) User's Guide," Revision 2, Nov. 1994.

NASA Goodard Space Flight Center, "Mission Analysis and Design Tool (Swingby)--The Swingby Tutorial," Update 2 (Draft Version), Sep. 1995.

ART-UNIT: 2128

PRIMARY-EXAMINER: Homere; Jean R.

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ATTY-AGENT-FIRM: Roberts Abokhair & Mardula, LLC

## ABSTRACT:

A system and method for orbital planning allows iterative calculations of orbital parameters to be accomplished in an automated way with one parameter solution serving as input to the next parameter's calculation. A software program employs a graphical user interface (GUI) to allow a space mission analyst to set up a series of sub-problems of any desired level of complexity. The program then implements the series automatically and sequentially, incorporating the solution to one sub-problem into the input to the next.

6 Claims, 10 Drawing figures

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TITLE: Method and apparatus for sequentially profiling and solving problems in space mission analysis

Application Filing Date (1):20000122Brief Summary Text (18):

Still others of the above objects are obtained by a computer program product embodied according to the present invention. The computer program product enables a computer to perform profiling and to solve space mission problems for which a space mission analysis scenario has been created. The computer program product includes software instructions for enabling the computer to perform predetermined operations, and a computer readable medium embodying the software instructions. The predetermined operations include the steps of setting up a control sequence that simulates a problem to be solved in the space mission, selecting control variables to be checked in solving the problem, and identifying parameters to be used in defining a desired results that represents an adequate solution to the problem. The predetermined operations also include steps of establishing profiles for each particular sub-problem of the problem to be solved, and running simulations for each of the established profiles to provide a result representing a solution to the problem to be solved.

Current US Cross Reference Classification (1):701/13

CLAIMS:

5. A computer program product for enabling a computer to perform profiling and solving space mission problems for which a space mission analysis scenario has been created, the computer program product comprising: software instructions for enabling the computer to perform predetermined operations, and a computer readable medium embodying the software instructions; the predetermined operations including the steps of: setting up a control sequence that simulates a problem to be solved in the space mission; selecting control variables to be checked in solving the problem; identifying parameters to be used in defining desired results that represents an adequate solution to the problem; establishing profiles for each particular sub-problem of the problem to be solved by: specifying which of the previously selected control variables should be varied for each particular sub-problem; and specifying what results should be achieved for each particular sub-problem; and running simulations for each of the established profiles to provide a result representing a solution to the problem to be solved.

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